Notice of Allowability	Application No.	Applicant(s)	
	09/608,657	ARECCO ET AL.	
	Examiner	Art Unit	
	David S. Kim	2633	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *11 April 2005*.

2. ☒ The allowed claim(s) is/are *1-3,6-10,13 and 16-24 (renumbered as claims 1-18)*.

3. ☒ The drawings filed on *29 December 2003* are accepted by the Examiner.

4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☒ All b) ☐ Some* c) ☐ None of the:
      1. ☒ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Mr. Thomas Frame, Esq. on 17 June 2005.

The application has been amended as follows:

Claims (notice the underlined and strikethrough portions)

Claim 1 (renumbered as claim 1). An autoprotected optical communication system, comprising:

a first optical carrier configured to transport optical signals in a first direction;

a second optical carrier configured to transport optical signals in a second direction that is opposite to the first direction; and

a plurality of nodes connected along the first optical carrier and the second optical carrier to form bidirectional links, the plurality of nodes communicating in pairs, one of the pairs defining a working link associated with a portion of the first optical carrier and a portion of the second optical carrier and being configured to exchange optical signals using a first wavelength on the first optical carrier and a second wavelength that is different from the first wavelength on the second optical carrier during a normal condition, the one pair of nodes being configured to exchange optical signals using the first wavelength on the second optical carrier and the second wavelength on the first optical carrier during a failure condition, wherein a response to the failure condition is executed on a channel level, and wherein each of the plurality of nodes includes a plurality of transmitting and receiving transponders, and wherein the plurality of transmitting transponders includes a first transmitting transponder optically coupled to the first optical carrier and configured to modulate a signal at the first wavelength, a second transmitting transponder optically coupled to the first optical carrier and configured to modulate a signal at a second wavelength, and a third transmitting transponder optically coupled to a second optical carrier and configured to modulate a signal at the first wavelength, the plurality of receiving transponders including a

first receiving transponder optically coupled to the second optical carrier and configured to demodulate a signal having the first wavelength, a second receiving transponder optically coupled to the second optical carrier and configured to demodulate a signal having the second wavelength, a third receiving transponder optically coupled to the first optical carrier and configured to demodulate a signal having the second wavelength, and wherein, under the normal condition, optical switches in an optical switch unit are configured to optically connect an optical transmitter to the first transmitting transponder, to optically connect the first receiving transponder to the third transmitting transponder, to optically connect the second receiving transponder to an optical receiver, and to optically connect the third receiving transponder to the second transmitting transponder.

Claim 6 (renumbered as claim 5). A method of providing autoprotection in an optical ring network that includes a first optical carrier, and a second optical carrier, and a plurality of nodes connected along the first optical carrier and the second optical carrier and configured to communicate in pairs to define bidirectional links, the method comprising:

exchanging optical signals between one of the pairs of nodes over one of the bidirectional links by using a first wavelength on the first optical carrier and a second wavelength on the second optical carrier during normal operation;

detecting a failed link among the bidirectional links;

reconfiguring the nodes in the one pair to invoke a protection scheme that uses the first wavelength on the second optical carrier and the second wavelength on the first optical carrier to avoid the failed link, wherein the step of reconfiguring comprises switching optical connections which selectively couple an optical transmitter and an optical receiver to the first optical carrier and the second optical carrier; and

transmitting a failure message between the nodes in the one pair based upon at least one of non-receipt of the optical signals and receipt of the optical signals that are degraded, wherein a response to a failure condition is executed on a channel level, and wherein each of the nodes includes a plurality of transmitting and receiving transponders, and wherein the plurality of transmitting transponders includes a first transmitting transponder optically coupled to the first optical carrier and configured to modulate a

signal at the first wavelength, a second transmitting transponder optically coupled to the first optical carrier and configured to modulate a signal at a second wavelength, and a third transmitting transponder optically coupled to a second optical carrier and configured to modulate a signal at the first wavelength, the plurality of receiving transponders including a first receiving transponder optically coupled to the second optical carrier and configured to demodulate a signal having the first wavelength, a second receiving transponder optically coupled to the second optical carrier and configured to demodulate a signal having the second wavelength, a third receiving transponder optically coupled to the first optical carrier and configured to demodulate a signal having the second wavelength, and wherein, under the normal condition, optical switches in an optical switch unit are configured to optically connect an optical transmitter to the first transmitting transponder, to optically connect the first receiving transponder to the third transmitting transponder, to optically connect the second receiving transponder to an optical receiver, and to optically connect the third receiving transponder to the second transmitting transponder.

Claim 13 (renumbered as claim 11). A reconfigurable node of an autoprotected optical communication ring network having a first optical carrier and a second optical carrier, comprising:

an optical transmitter configured to generate optical signals;

an optical receiver configured to receive optical signals; and

a plurality of transmitting transponders optically coupled to the first optical carrier and the second optical carrier;

a plurality of receiving transponders optically coupled to the first optical carrier and the second optical carrier; and

an optical switch unit that includes a plurality of optical switches coupled to the transmitting transponders and the receiving transponders, one of the optical switches being coupled to the optical transmitter, another one of the optical switches being coupled to the optical receiver, wherein the optical switches are configured to operate selectively under a normal operating condition and under a failure condition, the transponders using a first wavelength on the first optical carrier and a second wavelength that is different from the first wavelength on the second optical carrier during the normal condition, the transponders using the first wavelength on the second optical carrier and the second wavelength on the

first optical carrier during the failure condition, a response to a failure condition being executed on a channel level, the optical switch unit including a number of switching blocks that is twice a number of protected channels, and wherein the plurality of transmitting transponders includes a first transmitting transponder optically coupled to the first optical carrier and configured to modulate a signal at the first wavelength, a second transmitting transponder optically coupled to the first optical carrier and configured to modulate a signal at a second wavelength, and a third transmitting transponder optically coupled to a second optical carrier and configured to modulate a signal at the first wavelength, the plurality of receiving transponders including a first receiving transponder optically coupled to the second optical carrier and configured to demodulate a signal having the first wavelength, a second receiving transponder optically coupled to the second optical carrier and configured to demodulate a signal having the second wavelength, a third receiving transponder optically coupled to the first optical carrier and configured to demodulate a signal having the second wavelength, and wherein, under the normal condition, the optical switches are configured to optically connect the optical transmitter to the first transmitting transponder, to optically connect the first receiving transponder to the third transmitting transponder, to optically connect the second receiving transponder to the optical receiver, and to optically connect the third receiving transponder to the second transmitting transponder.

Claim 22 (renumbered as claim 4). The system of claim 1, further comprising:

another optical transmitter configured to generate an optical signal that includes information to be transmitted in the network; and

another optical receiver configured to receive an optical signal that includes information that has been transmitted in the network, wherein the plurality of transmitting transponders includes a fourth transmitting transponder optically coupled to the second optical carrier and configured to modulate a signal at the second wavelength, the plurality of receiving transponders including a fourth receiving transponder optically coupled to the first optical carrier and configured to demodulate a signal having the first wavelength, during normal condition, the optical switches being configured to connect the first receiving transponder to the third transmitting transponder, to connect the fourth receiving transponder

to the other receiver, and to connect the other optical transmitter to the ~~second~~ fourth transmitting transponder.

Claim 23 (renumbered as claim 10). The method of claim 6, further comprising:

providing another optical transmitter configured to generate an optical signal that includes information to be transmitted in the network; and

providing another optical receiver configured to receive an optical signal that includes information that has been transmitted in the network, wherein the plurality of transmitting transponders includes a fourth transmitting transponder optically coupled to the second optical carrier and configured to modulate a signal at the second wavelength, the plurality of receiving transponders including a fourth receiving transponder optically coupled to the first optical carrier and configured to demodulate a signal having the first wavelength, during normal condition, the optical switches being configured to connect the first receiving transponder to the third transmitting transponder, to connect the fourth receiving transponder to the other receiver, and to connect the other optical transmitter to the ~~second~~ fourth transmitting transponder.

Claim 24 (renumbered as claim 18). The ~~method of~~ node according to claim 13, further comprising:

another optical transmitter configured to generate an optical signal that includes information to be transmitted in the network; and

another optical receiver configured to receive an optical signal that includes information that has been transmitted in the network, wherein the plurality of transmitting transponders includes a fourth transmitting transponder optically coupled to the second optical carrier and configured to modulate a signal at the second wavelength, the plurality of receiving transponders including a fourth receiving transponder optically coupled to the first optical carrier and configured to demodulate a signal having the first wavelength, during normal condition, the optical switches being configured to connect the first receiving transponder to the third transmitting transponder, to connect the fourth receiving transponder to the other receiver, and to connect the other optical transmitter to the ~~second~~ fourth transmitting transponder.

2. The following is an examiner's statement of reasons for allowance:

The prior art of record does not teach or make obvious all the particular optical connections within the optical switch unit of the independent claims. In particular, the closest prior art of record (Shiragaki et al. European Patent Application EP 920153 A2) does not teach the following connections:

optical switches in an optical switch unit are configured to optically connect the first receiving transponder to the third transmitting transponder and to optically connect the third receiving transponder to the second transmitting transponder.

Some prior art references, such as Ballintine et al. (U.S. Patent No. 6,246,667 B1) and Sharma et al. (U.S. Patent No. 6,331,906 B1), teach switches that are configured to connect transponders to other transponders (Ballintine et al., Fig. 2; Sharma et al., Fig. 16B-16C). However, it appears that the connections accomplished in these references are mostly electrical connections, not optical.

3. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David S. Kim whose telephone number is 571-272-3033. The examiner can normally be reached on Mon.-Fri. 9 AM to 5 PM (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on 571-272-3022. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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